



The Joint Institute for Marine Observations (JIMO) is a NOAA Cooperative Institute at the Scripps Institution of Oceanography (SIO) of the University of California, San Diego (UCSD). JIMO has fostered collaborative research between NOAA scientists and academic scientists and students since its inception in 1991. In addition to UCSD/SIO, JIMO also oversees NOAA funding for all of the University of California (UC) in a multi-campus effort to promote collaboration and resource pooling. As such, SIO's facilities, including its fleet of 4 research vessels and one-of-a-kind research platform, are made available to NOAA and other Institutions through JIMO collaborations.

Research conducted by JIMO falls under one of four research themes: **(1) Climate and Coastal Observations, Analysis, and Prediction** – Study ocean observations, predict and model the climate, and study the atmosphere and ocean/atmosphere exchange and biogeochemical cycles; **(2) Biological Systems** - Work on Fisheries research, marine ecosystem monitoring and forecasting, protected species dynamics and protected areas and reef systems ecology. Of primary interest to this theme is the dynamics and physiological ecology of marine ecosystems; **(3) Research in Extreme Environments** – Perform research and development of rugged sensors, platforms and data transmission devices to perform in extreme environments (e.g., arctic or ice, high pressure or temperature, fog, hurricanes, sulfur pools, and anoxia) under adverse conditions; and **(4) Research and Development on Observations Systems** - Apply cutting-edge Research and Development efforts to current scientific research problems.

This year, JIMO scientists published over 206 scientific publications, of which approximately 50% appear in peer-reviewed publications. Some of this research involves gaining an understanding of the remote forcing functions that control fundamental ocean and atmosphere processes and to utilize this knowledge for prediction. The population dynamics and physiological ecology of marine ecosystems is a complex research question, which involves finely tuned long-term observation programs, and is also studied by JIMO scientists. Additional research involves the study of monsoonal dynamics and variability; and hurricane prediction, observations, tracking, and modeling. Toxic environment research is performed which takes place at the limits of biological survival. Anoxic waters, sulfur pools heavy metal contaminated sediments present difficult regions for measurement. Most of the extreme conditions are due to chemical or geochemical processes causing noxious conditions. Other research involves observation system development which ensures that there is state of the science research and development efforts brought to bear on the scientific problem. Platforms and instrumentation re-engineering, observing system reconfiguration, and data merging and display techniques modification are also performed. In general, JIMO takes an active role in support of research by enhancing the educational opportunities and breadth of training for students within the fields of oceanographic and atmospheric observations.

JIMO's research activities assist NOAA in all five of its Mission Goals: 1) Protect, restore, and manage the use of coastal and ocean resources through an ecosystem approach to management; 2) Understand climate variability and change to enhance society's ability to plan and respond; 3) Serve society's needs for weather and water information; 4) Support the Nation's Commerce with Information for Safe, Efficient, and Environmentally Sound Transportation; and 5) Provide Critical Support for NOAA's Mission.

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